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ABSTRACT

Noting that many reading-study techniques used by students to improve their comprehension and test scores fail because the students who need such assistance often lack the self-discipline to use them, this paper introduces S4R, a teacher-controlled reading-study method. After briefly describing each of the five components of the program, (Survey/Read/Recite/Record/Review), the paper describes three pilot studies that tested the technique with three different groups: engineers, secondary school administrators, and seventh grade students. The paper then reports the following conclusions based on the studies: (1) reading-study methods controlled by teachers rather than by students may be the distinguishing feature that causes such methods to be recognized on a broader scale, and (2) perhaps the most effective way to influence student use of reading-study techniques independently is to use them in the classroom. (FL)

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# Improving Textbook Learning With S4R: A Strategy for Teachers, Not Students

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## Introduction

One of the unchanged melodies of education is the textbook. While we have been busy updating curricula, modifying objectives, and altering content and covers of printed material, our dependency on the textbook itself continues unchanged. Related to our reliance on the textbook is the expectation that students will learn from printed materials. Unfortunately the ability to comprehend print depends a great deal on the reader's aptitude to deal with the complexity level of the selection. The wider the gap between the demands of a textbook and the capabilities of a student to read that book, the greater the need for direct intervention by the teacher.

To help those experiencing problems with textbooks many reading-study methods have been suggested to improve comprehension and remembering. Such techniques are known by clever acronyms such as SQ3R (Robinson, 1961), OK4R (Pauk, 1962), PANORAMA (Edwards, 1973), ESP (Kahn, 1978), REAP (Eanet and Manzo, 1978), PSC (Orlando, 1978), ALERT (Schele, 1980), and - believe it or not - MURDER (Dansereau et al, 1979).



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Although each claims to possess something unique most involve an initial survey, reading specified paragraphs, some form of recitation and/or note taking, and a final review.

In addition to the dearth of research available on such techniques, there are at least three substantial problems which cloud their effectiveness. First, relatively few teachers know about or train their students to use such methods. Second, the majority of these techniques are presented as student self-study procedures and not as classroom teaching strategies. The third problem is that students who need reading-study strategies the most, such as those with reading and/or learning difficulties, are the least likely to employ them. Those disciplined enough to use reading-study methods on a regular basis would likely achieve with or without such learning assistance.

The purpose of this article is to introduce S4R, a reading-study system designed to improve comprehending and remembering of information contained in a textbook. While S4R certainly can be utilized as a self-study method similar to those identified above, the focus here will be on S4R as it is used by the teacher in the classroom. The system will be briefly described, followed by initial research findings and implications for future use.

## The S4R System

S4R stands for SURVEY/READ/RECITE/RECORD/REVIEW. It can be used in classrooms where students are expected to learn primarily from printed material. S4R is designed to: (1) identify essential information to be learned; (2) articulate that information into several learning modalities (visual, auditory, and kinesthetic); (3) pass information through the memory system several times; and (4) ultimately increase test performance among all students. Many instructors rely heavily on textbooks and frequently assign chapters to be read for homework. Class lectures and discussions are often based on the reading assignments, and the tests used are either provided by the publisher of the texts or constructed by the teacher directly from the text. A large number of teachers use this approach from time to time, and the number of classes taught in this manner increases at the higher grade levels. Students involved in this type of instruction are the ones most likely to benefit from S4R. Each of the five components is briefly described here.

### S Stands for SURVEY

The SURVEY, also known as preview or overview, should be conducted when a new chapter is introduced or material is presented for the first itme. It is an excellent introduction

to the topic and provides students with a significant amount of information so that the content to be learned is clearly established. There are three steps to a survey, each conducted and controlled by the teacher.

1. Instruct students to read the title and the introduction to the chapter silently. If the introduction is not identified, select the paragraphs that, in your opinion, represent a good introduction.
2. Since most chapters are subdivided into major sections, point out the first section and direct students to carefuly read only the first sentence of that section. After a reasonable time period (when more than half of the class has completed their reading) ask for spontaneous recitation on what was learned from the reading of that section. Solicit statements, definitions, names, events, important vocabulary words, or any other information shared by students and in any order. Once completed, the next major section is read silently followed by a short recitation. This procedure is continued until all sections have been surveyed.
3. Finally, direct students to read the conclusion or summary if identified. If not identified as a heading, locate the final paragraphs that represent closing statements and assign them to be read

carefully and entirely.

THE SURVEY should take 30 minutes or so, but can be the most important step in the entire process, supplying from 40 to 60 percent of the information needed to pass a typical test. The recitation part of the SURVEY also assists those students with reading problems by translating much of the information into a verbal modality.

## First and Second "R" - READ AND RECITE

Reading and recitation are presented together because they should be taught together in the S4R system. The more often one stops to think or talk about what is read, the better the possibility that the information will be understood and remembered. Pauk states: "There is no principle that is more important than recitation for transferring material from the short-term to the long-term memory (1974, p. 69)."

Suppose you have just completed the SURVEY with a new chapter, and the students are to read a portion of that chapter for homework. In making the assignment, share the importance of reading and reciting with the class. Encourage them to stop after each paragraph to recite aloud what was learned. Remind them that if they are able to recite the information in the paragraph without looking back, they are far closer to understanding and remembering the information than they are when recitation draws a blank - a sure signal that a rereading

may be in order. Recitation which follows the reading of a paragraph or two also prevents that terrible discovery many of us experience on a regular basis - the realization that we have been reading page after page without remembering a single word.

The READ-RECITE procedure should also be used in class on the following day. Knowing that some followed your directions carefully and many others did not, begin class by directing students to quickly reread the first paragraph or two of the homework assignment. Follow that by asking for spontaneous recitation in the same manner as the SURVEY. Ask: "What did you learn?" Encourage students to share factual information, raise questions, bring up issues, define terms, and clarify or extend what another student may have left incomplete.

Third "R" - RECORD

The RECORD step is essential when students are expected to master information for a test. Effective recording requires the skill of determining what information is important enough to write down, and what information can be disregarded because it is non-essential. Referring to the process of selecting and rejecting Pauk states:

> To pare the job of learning down to a manageable size, you must decide which facts to master and

> which ones you can safely ignore . . . It is impossible to learn . . . all . . . details . . . Any person who tries to do so will become bewildered and will end by remembering less than if he had tried to master less material in the first place (1974, p. 63).

In the S4R system the best time to record facts is at the end of each READ-RECITE step. As the recitation reaches an adequate conclusion, the teacher should ask one or more of the following three questions:

1. What information from our recitation is important enough to write down?
2. If you were the teacher preparing the test over this material, what information would you include?
3. Are there dates, names, events, formulae, definitions, associations, or concepts that should be remembered?

Give students an opportunity to identify what they believe to be essential information that should be recorded. As each statement is made the teacher should remember two things related to recording appropriate information. First, students should be told whether their statements are important or not. This decision should be based on whether the information will appear on the test. Simple feedback such as "That statement

is worth recording!" or "We do not have to record that because . . . " can accomplish this. Second, since the teacher knows what is on the test, it is important to discuss those items not identified by the students. These two practices are essential if the "selecting" and "rejecting" process is to learned by students, one of the most important skills anyone could ever hope to master.

As essential information is identified the teacher should record the information on the chalkboard or overhead while each student copies the same information in a notebook for the REVIEW step. When the RECORD step is first used in the classroom, the teacher will need to draw out statements through questioning strategies. There will also be many statements that are non-essential for the test. However, students will quickly learn the selecting and rejecting process,and the need for teacher intervention will be greatly reduced.

Fourth "R" REVIEW

With the completion of a well-controlled RECORD step, each student will have a set of notes that, when reviewed properly, should result in good test scores. The reviewing of notes is the one part of the S4R system that students should control on their own. They should be taught to follow three steps.

1. Glance at the notes to get an idea of what has been recorded. Quickly cover those notes and attempt to recite aloud a much of the covered notes are possible.
2. Uncover the notes and check the accuracy of your recitation. If recitation is accurate and complete, move on to the next section of notes, repeating the process.
3. Continue the covering, recitation, and checking of notes until the material has been mastered.

## Initial Research With S4R

Three small pilot studies had been completed on S4R prior to the preparation of this manuscript, each worth sharing and each involving different components of the system. The first study involved 20 students enrolled in a graduate course in secondary reading methods at the University of Houston. After discussion on S4R the students, all secondary school administrators, agreed to an experiment using the SURVEY component of S4R. From each of two chapters in the textbook used in the course (Roe, Stoodt, and Burns, 1978), tests were constructed using multiple-choice, true-false, and completion items taken directly from those suggested in the instructor's manual supplied with the textbook. Each test

contained 50 items, each worth 2 points.

The first test, covering the content of Chapter Three, was administered prior to any reading or instruction in the chapter. The scores ranged from 14 to 52 with a mean of 28. The second test, over the content of Chapter Four, was administered immediately after the instructor guided the class through only the survey step of the S4R system, just as recommended - reading the introduction, the first sentence of each paragraph followed by recitation, and the summary of the chapter. The scores ranged from 26 to 82 with a mean of 54, an increase of 26 mean points over the first test.

In the second study 15 geologists and petroleum engineers enrolled in a rapid reading class taught for a major oil company in Houston, agreed to an experiment comparing comprehension scores under three conditions: taking tests (1) before reading the material, (2) after completing a SURVEY, and (3) after completing a SURVEY, READ, and RECITATION. Six 1000-word passages, each containing a test of 10 multiple-choice comprehension questions, were selected from How to Read & Study For Success in College (Norman and Norman, 1976), a text often used in college reading and study skills classes. The tests covering the content of the first two passages were administered without the participants ever seeing the passages. The tests covering the third and fourth passages were taken

immediately following a survey, conducted by the instructor. The tests covering the content of the fifth and sixth passages were taken immediately following a survey-read-recitation over the passages. Table 1 illustrates the mean percentage scores for each of the six tests under the three conditions stated above.

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Table 1 About Here

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The results show that the grand mean scores on the tests taken after the survey ($\overline{X}$ = 58.0) were twice as high as the scores on the tests taken without any reading or instruction ($\overline{X}$ = 29.0). Furthermore, the difference in mean scores between the survey only ($\overline{X}$ = 58) and the survey-read-recitation ($\overline{X}$ = 89.8) was 31.8 percentage points favoring the latter treatment.

The third study involved a seventh grade boy, named Peter, who was referred to a private clinic in Houston because of low grades in school. The science teacher had reported that Peter's test scores were 55, 40, 0 and 60 respectively resulting in a grade of "F" for the term.

The tutor assigned to work with Peter agreed to try the S4R system with the science textbook in an attempt to improve the student's test scores. During the initial visit to the clinic Peter brought his science text and showed the

tutor which chapter was being studied in the class. The tutor carefully conducted Peter through the survey step over the entire chapter. During each visit thereafter the tutor directed him through the READ-RECITE-RECORD steps of S4R, usually one paragraph at a time, until one section of the chapter was covered. The notes taken from the chapter were kept in a folder until the entire chapter was finished.

Three days prior to the test, the parents agreed to assist Peter in reviewing his notes. Each of the three nights was spent memorizing as much of the material as possible. The result of this effort was a 90 on the chapter test, later reduced to an 80 because of a 10 point penalty imposed for talking during the test. The experiment was continued for the next chapter and the resulting score was 95 with no penalty. Preparation for the third test was underway at this writing.

## Conclusions and Implications

S4R is not unlike other reading-study methods in most respects. Its acronym is not catchy like ESP, PANORAMA, REAP, or MURDER, and its individual components are not original. If there is a unique feature it may be that the individual at its control is the teacher rather than the student. This single difference, however, could be the feature that causes

S4R to be noticed.

While there are many uncontrolled factors in the three studies mentioned that should be considered in future research, the evidence collected thus far certainly should be noted. The administrators in the first study were intrigued enough to rewrite their five-year mission objectives to include an in-service in the use of S4R for all teachers in the eight schools under their jurisdiction. Employees in the apid reading course concluded that the use of the survey alone would triple the material they could cover in the same amount of time, save a great deal of reading of non-essential material, and provide sufficient information through the survey so they could determine whether additional reading may be desirable. The doctoral student working with Peter was excited enough to propose a dissertation study that will be conducted in the eight secondary schools mentioned above during the fall of 1981.

Students should be taught how to use reading-study methods independently, and those disciplined enough will continue to use them. The most exciting implication of the S4R system, however, is that its use by one teacher can effect the test performance of hundreds, particularly those in greatest need of assistance. Perhaps it is possible for students to learn reading-study skills because they are lead through such systems by teachers who are willing to build

such strategies into their regular teaching methods. Most would agree that supervised practice of a special technique is far better than a mere explanation (Stordahl and Christensen, 1956). Is there any better way of teaching students to use a strategy than to use it ourselves?

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Table 1

Mean Percentage Scores on 10-Item Comprehension Tests Taken Over Six 1000-Word Passages Under Three Conditions

Mean Percentage Scores

| Condition 1 | Condition 2 | Condition 3 |
|---|---|---|
| No Reading of Passage | Survey Only of Passage | Survey-Read & Recitation |
| Passage 1 34.1% | Passage 3 50.7% | Passage 5 93.6% |
| Passage 2 24.0% | Passage 4 65.3% | Passage 6 86.0% |
| $\bar{X}$ of 1&2 29.0% | $\bar{X}$ of 3&4 58.0% | X of 5&6 89.8% |

N = 15